Chapter 1
Introduction

1.1 Purpose

This manual provides guidance for the preparation of project-specific sampling and analysis plans (SAP) for the collection of environmental data. In addition, default sampling and analytical protocols are included which may be used verbatim or modified based upon project-specific data quality objectives (DQOs). The goal of this manual is to promote consistency in the generation and execution of sampling and analysis plans and thus to help generate chemical data of known quality for its intended purpose.

1.2 Applicability

This manual applies to all USACE Commands having responsibility for sampling and analysis of environmental samples. This includes, but is not limited to, USACE activities pursuant to and in support of execution of the following programs or sponsors: Defense Environmental Restoration Programs; Base Realignment and Closure; Superfund; Civil Works, Military Construction, installation environmental compliance; Defense Logistics Agency; Department of Energy; work for others; and any construction projects involving hazardous, toxic, and radioactive waste (HTRW).

1.3 References

Required and related publications are listed in Appendix A.

1.4 Explanation of Acronyms and Terms

Acronyms and special terms used in this manual are explained in the glossary.

1.5 Functional Equivalencies

1.5.1 The SAP has replaced the document that was formerly known as the Chemical Data Acquisition Plan. SAPs prepared in accordance with the guidance provided by this manual are intended to be functionally equivalent to U.S. Environmental Protection Agency (USEPA) sampling and analysis plans, field sampling plans, and quality assurance project plans prepared under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and to data collection quality assurance plans and data management plans prepared under the Resource Conservation and Recovery Act (RCRA).

1.5.2 The SAP is divided into two parts: a field sampling plan (FSP) and a quality assurance project plan (QAPP). The FSP addresses the field activities, including all aspects of sampling, drilling, monitoring well installation, and any field data gathering activities. The QAPP addresses the data quality objectives, analytical methodologies, specific quality assurance (QA) and quality control (QC) activities, laboratory requirements, and data assessment activities designed to achieve the data quality goals of the project.

1.5.3 This manual contains requirements for format and contents of the SAP and instructions for specifying and executing sampling, analysis, and related tasks for measurement of chemicals in the environment. Certain situations may require that the SAP be written differently from the format described in this manual. For example, work performed on behalf of certain USEPA regions may follow

a different SAP format from that prescribed within this manual. Many states have their own regulations regarding underground storage tanks, which may also impact SAP preparation. This manual complements existing USACE guidance as referenced in Appendix A.

1.6 Discussion

1.6.1 The SAP is a document prepared by an architect-engineer (A-E) firm, a remedial action contractor, or USACE to describe the project requirements for all field and laboratory activities, any data assessment activities, and contract deliverables related to the reporting of chemical data for HTRW remedial activities. When the SAP is prepared under contract (e.g., with an A-E firm), it is done in response to a scope of work (SOW) prepared by USACE that describes specific tasks and objectives of the project. Investigative projects include preliminary assessment/site inspections (PA/SI), remedial investigation/feasibility studies (RI/FS), engineering evaluation/cost analyses, RCRA facility assessments, RCRA facility investigations, and corrective measure studies.

1.6.2 In addition to investigative projects, this manual may be used for developing plans for data collection activities such as predesign bench and/or pilot studies, remedial action or post-closure monitoring, perimeter or offsite ambient air monitoring, etc. The size and complexity of a project will be reflected in the SAP. Although the guidance in this manual is applicable to radioactive wastes, unexploded ordnance, chemical warfare agents, and biological wastes, additional guidance may be necessary to prepare SAPs involving these materials. When chemical data are acquired, the SAP is one component of the overall project work plan. SAPs are required for each contractor work order. All details of field and laboratory activities must be described in the FSP and QAPP, respectively. These documents must be submitted to the appropriate USACE technical staff for review, comment, and approval. Once approved, the SAP represents the standard to which all activities are compared to assure compliance.

1.7 Relationship of SAP to the Project Work Plan

Per other USACE guidance on scoping HTRW investigative projects involving generation of analytical data, the SAP is included as an attachment to the project work plan. For those projects in which a work plan is not required, such as certain remedial actions, the SAP must be a stand-alone document.

1.7.1 Project work plan. The project work plan is an umbrella document that addresses, but is not necessarily limited to, the following subjects.

1.7.1.1 Project background. This section includes a brief summary of the site: size and location; ownership history; authority under which the work is to be performed; and the purpose and scope of the work plan. The inclusion of maps noting the location of the project within a state or county is recommended.

1.7.1.2 Site description and history. This section includes a description of the geology of the site, building structures, if any, topography of the site, etc. Other relevant information may include annual precipitation, prevailing wind direction, and site hydrology. It also includes a brief history of the site in terms of former activities, reported spills, and waste disposal practices that may have contributed to potential contamination over the years.

1.7.1.3 Previous investigations. This section includes discussion of previous investigation activities and other response activities at the site and also any problems and/or data anomalies.

1.7.1.4 Project objectives (long- and short-term). This section explains the purpose of the project: the regulatory framework under which the work is being conducted, what goals are to be met; and what questions are to be answered. In the case of a PA/SI, the objectives might include a determination of whether there is enough evidence to support the need for an RI/FS. In the case of an RI/FS, the objectives might include site contamination characterization in terms of extent and concentration, risk assessment, and the screening of remedial action alternatives. Applicable or relevant and appropriate requirements should be addressed. Much of the information in this chapter is helpful in guiding the preparation of the SAP.

1.7.1.5 Data gaps. This paragraph provides information regarding data gaps that need to be filled in order to make project decisions, such as defining the extent of contamination and choosing remedial action alternatives.

1.7.1.6 Data quality objectives (DQOs). This paragraph describes how data will be used to make project decisions. This paragraph may serve as a general scoping guide for data acquisition activities defined in the SAP.

1.7.2 SAP. The attachments to the project work plan (SAP, site safety and health plan, etc.) provide details of the specific data collection activities that are designed to support the objectives of the project, as set forth in the work plan. Information in the project work plan and SAP should not be redundant. Project-specific DQOs, including measurement quality objectives (MQOs) for precision, bias, representativeness, completeness, comparability, and sensitivity are addressed in the SAP. MQOs are applicable to both sampling and analytical portions of the project.

1.8 Technical Project Planning

1.8.1 As prescribed within Engineer Manual (EM) 200-1-2, Technical Project Planning Process, USACE and/or contractor technical planning teams are responsible for developing project-specific data collection programs that define the quality and quantity of data needed to perform all the engineering and scientific evaluations required for the project.

1.8.2 Initially, USACE and/or the contractor must identify the appropriate data users needed for the project. Data users involved are project dependent, and may include the customer, regulators, risk assessor, compliance or regulatory specialist, remedial design engineers, an attorney, etc. Data users will determine initial data needs in order to perform specific evaluations and make the engineering and scientific judgments required to complete the necessary activities leading to site closeout.

1.8.3 Sampling and analysis data implementors provide input to planning specific data collection tasks and are responsible for task execution based upon the project data needs. Data implementors are also chosen based upon the project and include technical personnel such as a geologist, hydrogeologist, chemist, statistician, sampling personnel, etc. This manual provides guidance to these data implementors for preparing SAPs for conducting field and analytical work and is a source of standard operating procedures (SOPs).

1.8.4 This manual provides both data users and implementors with a vehicle to prescribe sampling and analytical protocols necessary to achieve data quality objectives dictated by the technical project planning process.

1.9 Overview of Manual

1.9.1 This manual consists of four chapters, ten appendices and a glossary. Chapter 2 presents guidelines for use of the manual. Chapter 3 discusses format and content requirements of FSP and QAPP components of SAP. Chapter 4 lists guidelines for developing sampling and analysis protocols when those protocols in Appendices C, D, E, F, G, H, and I are not appropriate. Appendix B presents a table of holding times, preservatives, and sample containers for various parameters. Appendix C presents instructions for collecting environmental samples from various media. Appendix D gives hazardous waste sampling instructions. Appendix E gives sample handling instructions. Appendix F presents sample documentation and shipping instructions. Appendix G describes field QA/QC elements and procedures. Appendix H presents guidance on the application of field analytical technologies. Appendix I discusses general and method-specific chemical analysis requirements. Appendix J provides a review checklist for SAPs.

1.9.2 This manual will be revised as needed by modifying/adding instructions to incorporate changes and innovations within the environmental community, as well as changes in USACE policy.